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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/752,352	12/29/2000	Arthur Ray Alexander	9216	8424

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EXAMINER	
PATEL, ISHWARBHAI B	
ART UNIT	PAPER NUMBER
2827	

DATE MAILED: 10/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/752,352	ALEXANDER ET AL.	
	Examiner	Art Unit	
	Ishwar (I. B.) Patel	2827	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 July 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-8,17,19 and 20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-8,17,19 and 20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings were received on July 16, 2003. These drawings are approved.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5, is depending upon claim 4, but claim 4 is cancelled.

Applicant to appropriately amend the dependency.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Cao et al., US Patent No. 5,635,761, hereafter, Cao.

Regarding claim 1, Cao discloses a printed circuit board that includes:

a power layer for use in providing electrical power to circuit components (12);

a ground layer for use in carrying electrical current away from the circuit components (22); and

a loss element residing in an internal layer of the circuit board and connected electrically between the power layer and ground layer (44, see figure 3, column 6, line 10-40).

Regarding claim 6, Cao further discloses the loss element includes a resistor (44, see figure 3).

6. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Brown et al., US Patent No. 5,428,506, hereafter, Brown.

Regarding claim 1, Brown discloses a printed circuit board that includes:

a power layer for use in providing electrical power to circuit components (power layer 3);

a ground layer for use in carrying electrical current away from the circuit components (ground layer 6); and

a loss element residing in an internal layer of the circuit board and connected electrically between the power layer and ground layer (lossy material 4, see figure 1, column 3, line 1-40).

Regarding claim 2, Brown further discloses a capacitive element (16) connected in series with the loss element.

Regarding claim 3, Brown further discloses the capacitive element (16) reside in two different layers of the circuit board (see figure 1).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cao, as applied to claims 1 and 6 above, and further in view of Klaser, US Patent No. 4,870,746.

Regarding claim 7, the applicant is claiming the resistor value of the order of 1-10 ohms.

Cao fails to explicitly disclose the resistance value of 1-10 ohms, however discloses the desired value of resistance can be achieved by selecting suitable material and controlling the width of the resistor (column 6, line 30-40).

Klaser discloses a multilayer printed circuit board with resistor formed into the internal layer of the board by resistive paste using Polymer Thick Film and further discloses that resistive paste with different resistivities are available and can be blended to yield resistors having specific resistance value.

A person of ordinary skill in the art will use the known method / material to have the desired resistance value for the specific application.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the circuit board of Cao with the resistance value of 1-10 ohm of the resistor, from the teaching of Klaser, in order to have the desired control of the impedance and resultant signal reflection.

Regarding claim 8, the combination Cao and Klaser further discloses the resistor is formed from a polymer thick film, as applied to claim 7 above.

9. Claims 1-3, 5-8, 17, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Archambeault, US Patent No. 6,418,031, hereafter, Arch, in view of Ehman et al., US Patent No. 6,021,050, hereafter, Ehman.

Regarding claim 1, Arch discloses a printed circuit board that includes:

a power layer (32) for use in providing electrical power to circuit components;

a ground layer (34) for use in carrying electrical current away from the circuit components; and

a loss element (series resistance and capacitor element 54, see figure 4) connected electrically between the power layer and ground layer, but

fails to explicitly disclose the location of the elements in the internal layer of the circuit board.

Ehman discloses resistors and capacitors formed in the internal layers of the circuit board, using any commercially resistive paste or polymer resistor ink, referred to as polymer thick film, with a desired resistance value of 40 milliohm to 1 mega ohm per square, depending upon the electronic design requirement, column 3, line 20-60, **within the individual layers of printed circuit board, column 1, line 45-47, see figure 1**, and further discloses the resistors and capacitors on various layers of the board.

Ehman further discloses that by providing such passive element into the circuit board will reduce the space requirement for the passive component on the outer surface, resulting in the more space for the active electronic components.

Passive component mounted on the surface of the board is known in the art. A person of ordinary skill in the art will be motivated to form the passive components, such as resistor and capacitor into the inner circuit board layers to save the outer space for the active component resulting in the reduce space and reduced cost of the board.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide circuit board of Arch with the capacitors and resistors formed within the internal layer of the printed circuit board, as taught by Ehman to reduce the size of the board and to have resultant reduction in the cost of the board.

Regarding claim 2, the combination of Arch and Ehman further discloses a capacitive element connected in series with the loss element, as applied to claim 1 above.

Regarding claim 3, the combination of Arch and Ehman further discloses the capacitive element (16) reside in two different layers of the circuit board, as applied to claim 1 above (see figure 1).

Regarding claim 5, the combination of Arch and Ehman further discloses the loss element resides within an internal power or ground plane, as shown by Ehman, figure 1.

Regarding claim 6, the combination of Arch and Ehman further discloses the loss element includes a resistor as applied to claim 1 above.

Regarding claim 7, the combination of Arch and Ehman further discloses that the resistance can controlled to desired value, as applied to claim 1 above.

Regarding claim 8, the combination of Arch and Ehman further discloses the resistor is formed from a polymer thick film, as applied to claim 1 above.

Regarding claim 17, the combination of Arch and Ehman discloses all the features of the claimed invention, including a power layer and a loss element as applied to claim 1 above.

Regarding claim 19, the combination of Arch and Ehman further disclose the loss element includes a polymer thick film, as applied to claim 1 above.

Regarding claim 20, the combination of Arch and Ehman discloses all the features of the claimed invention, including a power layer and a resistive element formed in the power layer, as applied to claim 1 above.

Response to Arguments

10. Applicant's arguments with respect to claim1-3, 5-8, 17,19 and 20 have been considered but are moot in view of the new ground(s) of rejection.

Cao and Brown disclose loss element formed into the internal layer of the circuit boards.

Archambeault discloses resistors and capacitors connected in series to power and ground layers, without explicitly disclosing the actual location. However, Ehman discloses such passive component into the internal layer of the circuit board in order to

save space for other component on outer surface and as seen in figure the resistor if formed in with the conductive layer, see figure 1 and 2.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yamaguchi et al., discloses resistor (figure 22) and capacitor (figure 23) formed in the internal layer of the circuit board.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (703) 305 2617. The examiner can normally be reached on M-F (8:30 - 5).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (703) 308 1233. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305 3900.

Ernest F. Karlsen

ERNEST KARLSEN
PRIMARY EXAMINER

IBPatel
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10/14/03.